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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,288	06/27/2003	Bengt J. Akerman	001.0089	7886

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EXAMINER	
TRAN, MICHAEL THANH	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/609,288	AKERMAN ET AL.	
	Examiner	Art Unit	
	Michael t Tran	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,13-17,19,22,23,32 and 35* is/are rejected.

7)☒ Claim(s) *3,4,6-12,18,20,21,24-31,33 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *062703*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the Communications dated June 27, 2003, claims 1-35 are active in this application.

Information Disclosure Statement

2. The information disclosure statement filed June 27, 2003 has been considered.

Claim Objections

3. Claims 3, 4, 6-12, 18, 20, 21, 24-31, 33, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections – 35 U.S.C. § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed

under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1, 2, 5, 13-17, and 19 are rejected under 35 U.S.C 102(e) as being anticipated by Savtchenko et al. [U.S. Patent #6,545,906].

With respect to claim 1, Savtchenko et al. disclose a magnetoelectronics information device, comprising: a free magnetic region [15 of figure 1]; a pinned magnetic region [17 of figure 1]; and a tunneling barrier [16 of figure 1] interposed between said free magnetic region and said pinned magnetic region, wherein magnetic moments of said free magnetic region and said pinned magnetic region that are adjacent to said tunneling barrier are oriented to provide a first magnetization state when: a first magnetic field with a first field magnitude is produced in proximity to the magnetoelectronics information device at a first time (t1); a second magnetic field with a second field magnitude is produced in proximity to the magnetoelectronics information device at a second time (t2); said first magnetic field is adjusted to provide a third field magnitude that is less than said first field magnitude and greater than zero at a third time (t3); and said second magnetic field is adjusted to provide a fourth field magnitude that is less than said second field magnitude at a fourth time (t4). See "Summary of the Invention" section and figures 5 and 6.

With respect to claim 2, Savtchenko et al. discloses, in figures 5, 6, and 10, that $t1<t2<t3<t4$.

With respect to claim 5, Savtchenko et al. disclose, in column 9, that the magnetic moment of said free magnetic region is preferably unbalanced.

With respect to claim 13, Savtchenko et al. disclose, in figure 1, that the free magnetic region [15] comprises: a first ferromagnetic layer [45]; a second ferromagnetic layer [55]; and a non-magnetic layer [65] interposed between said first ferromagnetic layer and said second ferromagnetic layer.

With respect to claim 14, Savtchenko et al. disclose that the first ferromagnetic layer is at least partially formed of one material selected from the group comprising nickel, iron, or cobalt. See "Detailed Description of the Preferred Embodiments" section.

With respect to claim 15, Savtchenko et al. disclose that the second ferromagnetic layer is at least partially formed of one material selected from the group comprising nickel, iron, or cobalt. See "Detailed Description of the Preferred Embodiments" section.

With respect to claim 16, Savtchenko et al. disclose that the non-magnetic layer is at least partially formed of one material selected from the group ruthenium, osmium, rhenium, chromium, rhodium, or copper. See "Detailed Description of the Preferred Embodiments" section.

With respect to claim 17, Savtchenko et al. disclose that the pinned magnetic region [17] comprises an anti-ferromagnetic layer [66] adjacent to a ferromagnetic layer [56].

With respect to claim 19, Savtchenko et al. disclose that the magnetoelectronics information device is an MRAM element. See "Background of the Invention" section.

6. Claims 22, 23, and 32 are rejected under 35 U.S.C 102(e) as being anticipated by Savtchenko et al. [U.S. Patent #6,545,906].

With respect to claim 22, Savtchenko et al. disclose a magnetoelectronic information device having a free magnetic region [15], a pinned magnetic region [17] and a tunneling barrier [16] interposed between said free magnetic region and said pinned magnetic region, a method for writing the magnetoelectronics information device comprising the steps of: producing a first magnetic field with a first field magnitude in proximity to the magnetoelectronics information device at a first time [t1]; producing a second magnetic field with a second field magnitude in produced in proximity to the magnetoelectronics information device at a second time [t2]; adjusting said first magnetic field to provide a third field magnitude at a third time [t3] that is less than said first field magnitude and greater than zero; and adjusting said second magnetic field to provide a fourth field magnitude at a fourth time [t4] that is less than said second magnitude. See "Summary of the Invention" section and figures 5 and 6.

With respect to claim 23, Savtchenko et al. discloses, in figures 5, 6, and 10, that $t1<t2<t3<t4$.

With respect to claim 32, Savtchenko et al. disclose that the magnetoelectronics information device is an MRAM element. See "Background of the Invention" section.

7. Claim 35 is rejected under 35 U.S.C 102(e) as being anticipated by Savtchenko et al. [U.S. Patent #6,545,906].

With respect to claim 35, Savtchenko et al. disclose a MRAM element, comprising: a free magnetic region [15] comprising a first ferromagnetic layer [45], a second ferromagnetic layer [55] and a non-magnetic layer [65] interposed between said first ferromagnetic layer and said second ferromagnetic layer; a pinned magnetic region [17] magnetically coupled to said free magnetic region, said pinned magnetic region comprising a third ferromagnetic layer [56] and an anti-ferromagnetic layer [66]; and a tunneling barrier [16] interposed between said free magnetic region and said pinned magnetic region, wherein a magnetic moment of said free magnetic region is unbalanced [column 9] and magnetic moments of said free magnetic region and said pinned magnetic region that are adjacent to said tunneling barrier are oriented to provide a first magnetization state when: a first magnetic field with a first field magnitude is produced in proximity to the MRAM element at a first time [t1]; a second magnetic field with a second field magnitude is produced in proximity to the MRAM element at a second time [t2]; said first magnetic field is adjusted to provide a third field magnitude that is less than said first field magnitude and greater than zero at a third time [t3]; and said second magnetic field is adjusted to provide a fourth field

magnitude that is less than said second field magnitude at a fourth time [t4].

See "Summary of the Invention" section and figures 5 and 6.

Allowable Subject Matter

8. The following is an Examiner's statement of reasons for the indication of allowable subject matter: the prior art of records does not show (in addition to the other elements in the claim) the following:

- Wherein said first magnetic field is adjusted to provide a fifth field magnitude that is less than said third field magnitude at a fifth time (t5) that is greater than said fourth time (t4).
- the fractional balance ratio (Mbr) is in the range of about five hundredths (.05) to about one tenth (.1).
- said fourth magnetic field is adjusted to provide an eighth field magnitude that is less than said sixth magnitude at an eighth time (t8).
- Said fourth magnetic field is adjusted to provide a ninth field magnitude that is less than said eighth field magnitude at a ninth time (t9).
- Wherein said anti-ferromagnetic layer is at least partially formed of one material selected from the group comprising iridium manganese [IrMn], iron manganese [FeMn], rhodium manganese [RhMn], platinum manganese [PtMn], and platinum palladium manganese [PtPdMn].
- Wherein said third field magnitude is about fifty percent of the first field magnitude.

Conclusion

9. When responding to the Office action, Applicants are advised to provide the Examiner with line and page numbers of the application and/or references cited to assist the Examiner in the prosecution of this case.

10. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Michael T. Tran whose telephone number is (571) 272-1795. The Examiner can normally be reached on Monday-Thursday from 7:30-6:00 P.M.

11. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1650.

Michael T. Tran
Art Unit 2818
August 3, 2004